

REMARKS

The limitations of claims 9, 14, and 19 have been incorporated into independent claims 1, 6, and 7, respectively, by amendment herein.

The Examiner objected to the abstract of this disclosure. In response, Applicant has amended the abstract.

The Examiner rejected claims 1, 6 and 7 under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over: (1) claim 15 of U.S. Patent Application Publication No. 2006/0015550 A1; and (2) claim 1 of U.S. Patent No. 6,578,196 B1.

The Examiner rejected claims 1-19 under 35 U.S.C. § 101, because the claimed invention is allegedly directed to non-statutory subject matter.

The Examiner rejected claims 1-19 under 35 U.S.C. § 103(a) as allegedly being unpatentable over the rules of Algebra.

Applicant respectfully traverses the double patenting, § 101, and §103 rejections with the following arguments.

Double Patenting:

The Examiner rejected claims 1, 6 and 7 under the judicially created doctrine of obviousness-type double patenting as allegedly being unpatentable over: (1) claim 15 of U.S. Patent Application Publication No. 2006/0015550 A1; and (2) claim 1 of U.S. Patent No. 6,578,196 B1.

In response, Applicants asserts that the rejection of claims 1, 6, and 7 under the obviousness-type double patenting is moot, because claims 1, 6, and 7 have been amended to include the limitations of claims 9, 14, and 19, respectively, and claims 9, 14, and 19 have not been rejected under obviousness-type double patenting.

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35 U.S.C. §101

The Examiner rejected claims 1-19 under 35 U.S.C. § 101, because the claimed invention is allegedly directed to non-statutory subject matter.

In response, Applicant respectfully contends that the Examiner relies on obsolete recitations in the MPEP for support and that the Examiner's analysis of the language of the pending claims is not persuasive.

Examiner's Reliance on MPEP

In response, Applicant contends that the Examiner relies on obsolete recitations in the MPEP for support. In particular, the Examiner supports the claim rejections by citing the MPEP as "Fact 1" and "Fact 2".

In response, Applicant respectfully contends that the Examiner's reliance on the MPEP is misplaced because the Examiner is relying on obsolete recitations in the MPEP.

In MPEP Fact 1, the Examiner improperly relies on the following recitation: "To be statutory, a claimed computer-related process must either: (A) result in a **physical transformation outside the computer** for which a practical application in the **technological arts** is either disclosed in the specification or would have been known to a skilled artisan (discussed in i) below), or (B) be limited to a practical application within the **technological arts**".

In MPEP Fact 2, the Examiner improperly relies on the following recitation: "For such subject matter to be statutory, the claimed process must be limited to a practical application of the abstract idea or mathematical algorithm in the **technological arts**."

In response with respect to the preceding citations from MPEP Fact 1 and MPEP Fact 2, Applicant respectfully notes that the *Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility* (signed 26 October 2005) states: "The following tests are not to be applied by examiners in determining whether the claimed invention is patent eligible subject matter:

- (A) "not in the technological arts" test
- (B) Freeman-Walter-Abcde test
- (C) mental step or human step tests
- (D) the machine implemented test
- (E) the *per se* data transformation test."

Applicant asserts that the Examiner's reliance on the MPEP has not taken into account the preceding recitation in the *Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility* (signed 26 October 2005), which is based on *Ex Parte Carl A. Landgren*, Appeal No. 2003-2088, Application 08/093,516, heard April 20, 2004 before the Board of Patent Appeals and Interferences, Paper No. 78. The cited Interim Guidelines make it clear that a very broad scope of patentable subject matter is permitted under 35 U.S.C. § 101.

Since the Examiner's analysis of claims 1-19 is based on obsolete recitations of the MPEP, and since the Examiner has not taken into account the preceding recitation in the *Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility* (signed 26 October 2005), Applicant respectfully submits that the rejection of claims 1-19 under 35 U.S.C. § 101 is improper and should be withdrawn.

Examiner's Analysis of Claim Language

Applicant respectfully contends that the Examiner's analysis of the language of the pending claims is not persuasive.

The Examiner argues: "Regarding term, "in a computer environment", it should be noted that thing such as a computer desk is also a computer environment."

In response, Applicant notes the recitation of "for use in compiler optimisation of source code and like computing tasks" and "compiling said source code into object code, wherein said source code comprises said two algebraic expressions, and wherein said compiling comprises said recasting, said reducing, and said comparing" excludes the possibility that the computer environment is limited to a computer desk.

The Examiner argues: "In Claim 1, as it defines in the preamble, "A method of determining, in a computer environment, the equivalence, if any, of two algebraic expressions", this method is followed by steps (a), (b), and (c), where (a), (b), and (c) are solely a manipulation of the two algebraic expressions. The three steps, at first fail to be a tangible process, thus cannot produce a practical, concrete, and tangible result. The three steps are merely manipulating and arranging the variables and the arithmetic symbols within the algebraic expressions such as described in the specification."

In response, Applicant asserts that steps (a) - (c) of claim 1 does more than manipulate algebraic expressions. Step (a) generates strings, subject to the string being a sequence of token pairs, each token pair comprising an operator followed by an operand. Step (b) reduces the

strings of step (a) according to simplifying rules. Step (c) performs a logical operation, namely comparing the reduced strings.

The Examiner argues: "the claim is not quite different from example in MPEP for the nonstatutory case, the calculation of a mathematical algorithm that models noise."

In response, Applicant asserts that the Examiner's reliance on the MPEP ignores the *Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility* (signed 26 October 2005), as explained *supra*.

The Examiner argues: "Such claiming is the preemption of a rule of nature in math and known to any skills of the art. Nothing is new and thus it will not produce any practical applications." (emphasis added).

In response, Applicant asserts that the Examiner's reliance on the argument that "Nothing is new" may be pertinent to examining the claims in light of 35 U.S.C. § 102 and 35 U.S.C. § 103, but cannot be used to reject the claims under 35 U.S.C. § 101.

In further response, Applicant asserts that the phrase "a rule of nature in math" is ambiguous and the meaning of "a rule of nature in math" cannot be understood by a person of ordinary skill in the art.

The Examiner argues: "The Claim is merely the manipulation of a mathematical formula/expression/principle. Thus, the Claim is nonstatutory because it preempts the rules of nature of math and it presents a mere abstract idea".

In response, Applicant asserts that the preceding argument by the Examiner is misdirected, because whether or not the claims present an abstract idea is not a correct legal test. Rather, the correct legal test is whether the claims produce a useful, concrete and tangible result. See *State Street Bank & Trust Co. v. Signature Financial Group, Inc.*, 47 U.S.P.Q.2nd 1596, 1601 (Fed. Cir. 1998), reciting:

"Unpatentable mathematical algorithms are identifiable by showing they are merely abstract ideas constituting disembodied concepts or truths that are not "useful." From a practical standpoint, this means that to be patentable an algorithm must be applied in a "useful" way. In *Alappat*, we held that data, transformed by a machine through a series of mathematical calculations to produce a smooth waveform display on a rasterizer monitor, **constituted a practical application of an abstract idea** (a mathematical algorithm, formula, or calculation), because it produced "a useful, concrete and tangible result"—the smooth waveform.

Similarly, in *Arrhythmia Research Technology Inc. v. Corazonix Corp.*, 958 F.2d 1053, 22 USPQ2d 1033 (Fed. Cir. 1992), we held that the transformation of electrocardiograph signals from a patient's heartbeat by a machine through a series of mathematical calculations **constituted a practical application of an abstract idea** (a mathematical algorithm, formula, or calculation), because it **corresponded to a useful, concrete or tangible thing**—the condition of a patient's heart.

Today, we hold that the transformation of data, representing discrete dollar amounts, by a machine through a series of mathematical calculations into a final share price, constitutes a practical application of a mathematical algorithm, formula, or calculation, because it produces "a useful, concrete and tangible result!"

In addition, Applicants request that the Examiner explain why the Examiner has not given favorable consideration to claims 9, 14, and 19 ("compiling said source code into object code") which produces a useful, concrete and tangible result, even without considering the *Interim Guidelines for Examination of Patent Applications for Patent Subject Matter Eligibility* (signed 26 October 2005). Note that the limitations of claims 9, 14, and 19 have been incorporated into claims 1, 6, and 7, respectively, by amendment herein.

35 U.S.C. § 103(a)

The Examiner rejected claims 1-19 under 35 U.S.C. § 103(a) as allegedly being unpatentable over the rules of Algebra.

Applicants respectfully contend that claims 1, 6, and 7 are not unpatentable over the rules of algebra, because the rules of Algebra does not teach or suggest each and every feature of claims 1, 6, and 7.

A first reason why claims 1, 6, and 7 are not unpatentable over the rules of algebra is that the rules of algebra do not teach the feature: "recasting said expressions into a form of one or more token pairs arranged sequentially in a string, each said token pair comprising an operator followed by an operand".

The Examiner argues: "Algebra rules show (a): For example, take $(a+b)(a-b)$, one expression and a^2-b^2 , another expression, they are equivalent and will be recasting into a form $a^2a-a^2b+a^2b-b^2b$, by using the known rules of algebra".

In response, Applicant asserts that the feature of "each said token pair comprising an operator followed by an operand" does not read on the Examiner's example.

A second reason why claims 1, 6, and 7 are not unpatentable over the rules of algebra is that the rules of algebra do not teach the feature: "reducing said strings in accordance with a set of predetermined simplifying rules".

The Examiner argues: "Algebra rules show (b): For example $a^2a-a^2b+a^2b-b^2b$ is reduced by algebraic rules as a^2a-b^2b . (b) reducing said strings in accordance with a set of

predetermined simplifying rules".

In response, Applicant asserts that the Examiner's argument is logically flawed because the Examiner's example for step (a) requires that the expressions $(a+b)(a-b)$ and a^2-b^2 be reduced in step (b). Instead, the Examiner recites reducing $a^2-a^2b+a^2b-b^2b$ in step (b).

A third reason why claims 1, 6, and 7 are not unpatentable over the rules of algebra is that the rules of algebra do not teach the feature: "comparing the reduced strings by matching, to detect equivalence of the two algebraic expressions".

The Examiner argues: "Algebra rules show (c): For example $(a+b)(a-b) = a^2-b^2$; and a^2-b^2 is another expression of $a^2-a^2b+a^2b-b^2b$. In fact $(a+b)(a-b)$ equals to a^2-b^2 , equals to $a^2-a^2b+a^2b-b^2b$. (c) comparing the reduced strings by matching, to detect equivalence of the two algebraic expressions."

In response, Applicant asserts that the Examiner's argument is logically flawed because the Examiner's example for step (a) requires that the expressions $(a+b)(a-b)$ and a^2-b^2 be reduced in step (b), and the reduced strings from step (b) be compared in step (c). The Examiner's example does not compare the reduced strings from step (b), said reduced strings having been reduced from the expressions $(a+b)(a-b)$ and a^2-b^2 as assumed by the Examiner in step (a).

A fourth reason why claims 1, 6, and 7 are not unpatentable over the rules of algebra is that the Examiner has not provided a persuasive argument as to why it is allegedly obvious to combine steps (a), (b), and (c) sequentially as claimed.

The Examiner argues: "Therefore, it would be obvious to an ordinary in the art to apply

rules/notation of algebra to implement the claim."

In response, Applicant respectfully contends that the preceding argument by the Examiner is conclusory, because the Examiner's argument concludes what it assumes, namely the alleged obviousness of combining steps (a), (b), and (c) sequentially as claimed. Applicant asserts that the Examiner has not cited any prior art that discloses motivation to support the alleged obviousness of combining steps (a), (b), and (c) sequentially as claimed.

A fifth reason why claims 1, 6, and 7 are not unpatentable over the rules of algebra is that the rules of algebra do not teach the feature: "compiling said source code into object code, wherein said source code comprises said two algebraic expressions, and wherein said compiling comprises said recasting, said reducing, and said comparing".

The Examiner argues: "Claim recites an intended use of the preamble, because the Claim 9 does not relate to the scope of determining. Official notice is taken that compiling is common method for converting a programming source code into an object code (Refer to a well-known book "Compilers, Principles, Technique, and Tools"; Authors: Aho et al.). It is obvious to ordinary in the art to use and to include for taking advantage of well-known compilation rules."

In response, Applicant asserts that the Examiner's argument is incorrect, because claims 1, 6, and 13 recite the active method step of "compiling said source code into object code". Therefore, the "compiling" step is not an intended use and is entitled to full patentable weight. Moreover, the recitation of the "compiling" step explicitly in the body of claims 1, 6, and 7 gives patentable weight to the feature of "for use in compiler optimisation of source code and like computing tasks" in the preamble.

In addition, the rejection of claims 1, 6, and 7 over the rules of algebra is improper, because the rules of algebra do not teach or suggest the feature of "compiling said source code into object code, wherein said source code comprises said two algebraic expressions". Applicant requests that the Examiner provide a prior art reference that allegedly discloses that the laws of algebra teaches or suggests the feature of "compiling said source code into object code, wherein said source code comprises said two algebraic expressions".

A sixth reason why claims 1, 6, and 7 are not unpatentable over the rules of algebra is that the Examiner has not provided any argument as to why it is allegedly obvious to combine steps (a), (b), (c) and (c1) sequentially as claimed.

Based on the preceding arguments, Applicants respectfully maintain that claims 1, 6, and 7 are not unpatentable over the rules of Algebra, and that claims 1, 6, and 7 are in condition for allowance. Since claims 2-5 and 8 depend from claim 1, Applicants contend that claims 2-5 and 8 are likewise in condition for allowance. Since claims 10-13 depend from claim 6, Applicants contend that claims 10-13 are likewise in condition for allowance. Since claims 15-18 depend from claim 7, Applicants contend that claims 15-18 are likewise in condition for allowance.

CONCLUSION

Based on the preceding arguments, Applicants respectfully believe that all pending claims and the entire application meet the acceptance criteria for allowance and therefore request favorable action. If the Examiner believes that anything further would be helpful to place the application in better condition for allowance, Applicants invites the Examiner to contact Applicants' representative at the telephone number listed below. The Director is hereby authorized to charge and/or credit Deposit Account 09-0457.

Date: 05/11/2006

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